

THE FISHES OF THE SOUTH AUSTRALIAN GOVERNMENT
TRAWLING CRUISE, 1914.

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and

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[*Contribution from the South Australian and Australian
Museums.*]

PLATES XII. TO XV. AND TEXT FIGURE 1.

[Read October 14, 1915.]

As a result of the prospecting cruise of the ill-fated Federal trawler "Endeavour" in South Australian waters, the Director, the late Harald C. Dannevig, reported rich fishing grounds in the Great Australian Bight.

With a view to reaping some of the harvest there indicated, the South Australian Government chartered the trawler "Simplon" (Capt. W. Brown), and the senior author accompanied the vessel on her cruise in the interests of the Government and of the South Australian Museum, while the Fisheries Department was represented by Inspector W. D. Bruce. Owing to extremely unfavourable weather and the consequent limitation of operations, together with unpayable catches of fish, one essay only was made. The cruise extended from September 16 to October 1, 1914, and embraced the area between lat. $32^{\circ} 36'$ and $34^{\circ} 50'$ S., and long. $128^{\circ} 45'$ and $133^{\circ} 12'$ E., the depths exploited ranging from 22 to 140 fathoms. Of the ten hauls made, eight were technically successful, but of these, two only were regarded as payable. The best haul produced ten baskets of fish, about 700 lb. in weight, composed almost wholly of Swallow-tails (*Trachichthodes lineatus*).

In the absence of a larger and faster vessel, it can scarcely be expected that trawling will be commercially profitable on grounds so far distant from the port of Adelaide as those prospected by the "Endeavour." As regards the "Simplon," it necessitated a voyage of 500 miles before the trawl was put over, and a similar distance had to be traversed when the fishing was concluded. The cost in coal, wages, etc., under these conditions is such a heavy item, that phenomenal catches would have to be made to recoup the outlay. The first step towards the institution of trawling in South Australia must undoubtedly be a systematic survey

of our waters, to ascertain what trawling grounds we possess nearer market, their extent and capabilities.

It may not be out of place in the record of a trawling cruise, to draw attention to the fact that, whereas formerly the people of Australia and New Zealand were extremely prejudiced against eating any but what were regarded as the primest fish, such a change of opinion or practice has taken place, that species previously despised now command a ready and eager sale. In Adelaide, as doubtless everywhere else, fish is served and accepted at public tables under assumed names, but, further than this, the public is buying so-called inferior kinds in the open market. In New South Wales the State trawlers are regularly disposing of large quantities of fish which a few years ago would have had to be thrown away as unsaleable. Now, however, tons of Rays (*Urolophus*, *Aetobatis*, *Raja*) are utilized: even the largest Sting Rays (*Dasyatis*) are cut up and sold, generally under the name of "Skate," and the fishermen themselves eat them on board in preference to other fish. The "fish-bone" trouble will thus, at any rate, be avoided. The much despised Leather Jacket (*Cantherines agraudi*), the *bete noir* of the line fisherman, is now eagerly purchased, while the Flying Gurnard (*Pterygotrigla polyommata*), formerly regarded as of small account, is not only readily marketed, but has proved to be one of the most abundant of the edible fishes of the deeper waters of New South Wales.

The change here briefly indicated may be due to the increased cost of meat consequent on the war and on drought conditions, but the encouraging fact remains that having thus eaten despised fishes as a *quasi* enforced experiment, the public will, it is believed, in future purchase such fishes under any condition, and the trawling industry is likely to be enormously benefited, and it is hoped extended thereby. We believe that it is well within the mark when we say that hitherto fully half a trawler's catch of good wholesome fish had to be returned to the sea owing to prejudice. In thus making greater use of our marine wealth we are but following the lead of Britain, where twenty years ago Dog Fishes and other so-called coarse fish were thrown away as offal, but to-day find a ready market.⁽¹⁾

Further discussion on the economic aspect of trawling is outside the province of the paper, the object of which is to enumerate the fishes obtained.

The Ostracions, merely listed here, form the subject of a separate paper.

(1) Waite, "Sci. Results N.Z. Govt. Trawling Exp.," Rec., Cant. Mus., i., 1911, p. 280, *et seq.*

All localities may be quoted as the Great Australian Bight.

Details of the eight effective hauls (stations) are as follows:—

STATION.	TIME. 1914.	POSITION.	DEPTH IN FATHOMS.	FISHES TAKEN.
1.	Sept. 20, 7.30 to 10.45 p.m.	Lat. 33° 29' S. Long. 128° 55' E.	45-82	<i>Trachichthodes gerrardi</i>
2.	Sept. 21, 9.30 to 11.30 a.m.	Lat. 32° 36' S. Long. 129° 54' E.	22	<i>Parascyllium ferrugineum</i> <i>Eugaleus australis</i> <i>Urolophus cruciatus</i> <i>Dasyatis brevicaudatus</i> <i>Caianx georgianus</i> <i>Pseudolabrus tetricus</i> <i>Cantherines ayraudi</i> <i>Cantherines setosus</i> <i>Capropygia unistriata</i> <i>Aracana aurita</i> <i>Tetraodon armilla</i>
3.	Sept. 21, 5.40 to 9 p.m.	Lat. 33° 38' S. Long. 128° 45' E.	80-140	<i>Squatina australis</i> <i>Urolophus cruciatus</i> <i>Trachichthodes gerrardi</i> <i>Trachichthodes lineatus</i> <i>Dactylosparus macropterus</i> <i>Oplegnathus woodwardi</i> <i>Zanclistius elevatus</i> <i>Pentaceropsis recurvirostris</i> <i>Cyttosoma boops</i> <i>Neosebastes thetidis</i> <i>Pterygotrigla polyommata</i> <i>Neoplatycephalus conatus</i> <i>Kathetostoma nigrofasciatum</i> <i>Cantherines ayraudi</i> <i>Capropygia unistriata</i> <i>Aracana angusta</i> <i>Tetraodon armilla</i> <i>Atopomycterus nictemerus</i>
4.	Sept. 22, 12.15 to 4 a.m. (night haul)	Five miles north- west from Sta- tion 3	88-94	<i>Heterodontus philippi</i> <i>Scylliorhinus analis</i> <i>Galeorhinus antarcticus</i> <i>Squalus fernandinus</i> <i>Squatina australis</i> <i>Trachichthodes gerrardi</i> <i>Trachichthodes lineatus</i> <i>Paratrachichthys trailli</i> <i>Callanthias allporti</i> <i>Plagiogeneion macrolepis</i> <i>Dactylosparus macropterus</i> <i>Oplegnathus woodwardi</i> <i>Zanclistius elevatus</i>

STATION.	TIME. 1914.	POSITION.	DEPTH IN FATHOMS.	FISHES TAKEN.
4.	<i>Continued</i>			<i>Pentaceropsis recurvirostris</i> <i>Cyttosoma boops</i> <i>Neosebastes thetidis</i> <i>Neoplatycephalus conatus</i> <i>Chelidonichthys kumu</i> <i>Kathetostoma nigrofasciatum</i> <i>Cantherines ayraudi</i> <i>Anoplocapros gibbosus</i> <i>Tetraodon armilla</i>
5.	Sept. 28, 4.15 to 5.30 p.m.	Lat. 34° 43' S. Long. 133° 12' E	85	<i>Urolophus cruciatus</i> <i>Trachichthodes gerrardi</i> <i>Trachichthodes lineatus</i> <i>Pterygotrigla polyommata</i> <i>Cantherines ayraudi</i> <i>Cantherines hippocrepis</i> <i>Capropygia unistriata</i> <i>Aracana aurita</i>
6.	Sept. 28, 8 to 11.15 p.m.	Same as Station 5	85	<i>Galeorhinus antarcticus</i> <i>Pristiophorus nudipinnis</i> <i>Trachichthodes gerrardi</i> <i>Trachichthodes lineatus</i> <i>Dactylosparus macropterus</i> <i>Oplegnathus woodwardi</i> <i>Zanclistius elevatus</i> <i>Pentaceropsis recurvirostris</i> <i>Pterygotrigla polyommata</i> <i>Kathetostoma nigrofasciatum</i> <i>Cantherines ayraudi</i> <i>Capropygia unistriata</i> <i>Tetraodon armilla</i>
7.	Sept. 29, 12.30 to 4.30 a.m. (night haul)	Lat. 34° 50' S. Long. 133° 11' E.	85	<i>Pristiophorus nudipinnis</i> <i>Trachichthodes gerrardi</i> <i>Trachichthodes lineatus</i> <i>Paratrachichthys trailli</i> <i>Dactylosparus macropterus</i> <i>Oplegnathus woodwardi</i> <i>Neosebastes thetidis</i> <i>Neoplatycephalus conatus</i> <i>Kathetostoma nigrofasciatum</i> <i>Cantherines mosaicus</i> <i>Tetraodon armilla</i>
8.	Sept. 29, 11.30 a.m. to 3.30 p.m.	Lat. 34° 46' S. Long. 133° 10' E.	72	<i>Trachichthodes gerrardi</i> <i>Trachichthodes lineatus</i> <i>Callanthias allporti</i> <i>Dactylosparus macropterus</i> <i>Pterygotrigla polyommata</i> <i>Cantherines setosus</i> <i>Capropygia unistriata</i>

Family HETERODONTIDAE.

HETERODONTUS, Blainville, 1816.

HETERODONTUS PHILIPPI, Bloch and Schneider.

Squalus philippi, Bloch and Schneider: Syst. Ichth., 1801, p. 134.*Heterodontus philippi*, Blainville: Bull. Soc. Phil., 1816, p. 121.*Cestracion philippi*, Cuvier: Reg. Anim., ii., 1817, p. 129.*Centracion philippi*, Garman: Mem. Mus. Comp. Zool., xxxvi., 1913, p. 182.

Port Jackson Shark.

Station 4, 88-94 fathoms; also taken on hand lines in Streaky Bay in 8 fathoms.

Family SCYLLIORHINIDAE.

SCYLLIORHINUS, Blainville, 1816.

SCYLLIORHINUS (HALAELURUS) ANALIS, Ogilby.

Scyllium maculatum, Ramsay: Proc. Linn. Soc., N.S.W., v., 1880, p. 97 (not *S. maculatum*, Bloch and Schneider).*Scyllium anale*, Ogilby: *ib.*, x., 1885, p. 445.*Scyliorhinus analis*, *id.*: *ib.* (2), iv., 1889, p. 180.*Catulus analis*, Waite: Mem. Aust. Mus., iv., 1899, p. 31, pl. ii., fig. 1.*Halaelurus analis*, Garman: Mem. Mus. Comp. Zool., xxxvi.; 1913, p. 85.

Spotted Dog Fish.

Station 4, 88-94 fathoms.

Family ORECTOLOBIDAE.

PARASCYLLIUM, Gill, 1861.

PARASCYLLIUM FERRUGINEUM, McCulloch.

Parascyllium ferrugineum, McCulloch; "Endeavour" Sci. Res., i., 1911, p. 7, pl. ii., fig. 2, and text fig. 2.

Rusty Dog Fish.

Station 2, 22 fathoms.

Family GALEORHINIDAE.

GALEORHINUS, Blainville, 1816 (*vide* Garman).

GALEORHINUS ANTARCTICUS, Günther.

Mustelus antarcticus, Günther: Cat. Fish. Brit. Mus., viii., 1870, p. 387.*Galeus antarcticus*, Waite: Mem. Aust. Mus., iv., 1899, p. 33.

Gummy.

Station 4, 88-94 fathoms, and Station 6, 85 fathoms.

Family CARCHARHINIDAE.

EUGALEUS, Gill, 1864 (*vide* Garman).

EUGALEUS AUSTRALIS, Macleay.

Galeus australis, Macleay: Proc. Linn. Soc., N.S.W., vi., 1881, p. 354.*Galeorhinus australis*, Hutton: Index Faunae, N.Z., 1904, p. 54.

School Shark.

Station 2, 22 fathoms.

Family SQUALIDAE.

SQUALUS, Linnaeus, 1758.

SQUALUS FERNANDINUS, Molina.

Squalus fernandinus, Molina: Saggio sul. stor. nat. Chili, 1782, p. 229.*Spinax fernandezianus*, Gay: Hist. Chile, ii., 1854, p. 365.

Spiny Dog Fish.

Station 4, 88-94 fathoms.

Family PRISTIOPHORIDAE.

PRISTIOPHORUS, Müller and Henle, 1837.

PRISTIOPHORUS NUDIPINNIS, Günther.

Pristiophorus nudipinnis, Günther: Cat. Fish. Brit. Mus., viii., 1870, p. 432.

Saw Shark.

Stations 6 and 7, 85 fathoms.

Family SQUATINIDAE.

SQUATINA, Valmont, 1768.

SQUATINA AUSTRALIS, Regan.

Squatina australis, Regan: Ann. Mag. Nat. Hist., (7), xviii., 1906, p. 438.

Angel Shark.

Station 3, 80-140 fathoms, and Station 4, 88-94 fathoms.

Family DASYATIDAE.

UROLOPHUS, Müller and Henle, 1837.

UROLOPHUS CRUCIATUS, Lacépède.

Raia cruciatus, Lacépède: Ann. Mus., iv., 1804, p. 201.*Leiobatus cruciatus*, Blainville: Bull. Soc. Phil., 1816, p. 121; 1837, p. 117.*Urolophus cruciatus*, Müller and Henle: Monatsb. Akad. Wiss., Berlin, 1837, p. 117.*Urolophus ephippiatus*, Richardson: Voy. "Ereb. and Terr.," 1848, p. 35, pl. xxiv.

Banded Stingaree.

Station 2, 22 fathoms; Station 3, 80-140 fathoms; and Station 5, 85 fathoms.

DASYATIS, Rafinesque, 1810.

(?) DASYATIS BREVICAUDATUS, Hutton.

Trygon thalassia, Hutton: Cat. Fish., N.Z., 1872, p. 85.

Trygon brevicaudata, Hutton: Ann. Mag. Nat. Hist., (4), xvi., 1875, p. 317.

Dasybatis brevicaudatus, id.: Index Faunae N.Z., 1904, p. 53.

Dasyatis brevicaudatus, McCulloch: "Endeavour" Sci. Res., iii., p. 102, pl. xv., fig. 1, pl. xvii., fig. 1.

Sting Ray.

Station 2, 22 fathoms. A smooth-backed Sting Ray, presumed to be of this species, was thrown overboard before it could be further examined.

Family BERYCIDAE.

TRACHICHTHODES, Gilchrist, 1903.

TRACHICHTHODES LINEATUS, Cuvier and Valenciennes.

Beryx lineatus, Cuv. and Val.: Hist. Nat. Poiss., iii., 1829, p. 226. Günther: Cat. Fish. Brit. Mus., i., 1859, p. 13.

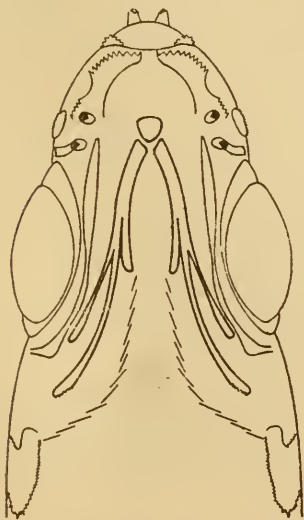
Beryx mulleri, Klunzinger: Sitz. Akad. Wiss. Wien., lxxx., 1880, p. 359, pl. iii., fig. 1.

Swallow-tail.

B. viii.; D. vi. 14; A. iv. 14; P. 14; V. i. 7; C. 18 + 10; L. lat. 51; L. tr. 6 + 15.

Length of head 3.17, height of body 2.6, and length of caudal 2.01 in the length, diameter of eye 2.6, interorbital space 3.5, and length of snout 3.9 in the head.

Head short, deeper than long, its profile steep and straight. The eye is round, half the depth of the head at the



Trachichthodes lineatus,
C. and V.

orbit; its hinder edge lies midway between the posterior nostril and the margin of the opercle. The hinder nostril is the larger, and the bridge is comparatively narrow. The maxilla extends slightly beyond the middle of the eye; it is greatly broadened behind, its distal portion being fully half the diameter of the orbit; a jagged spine at its upper end, the base of which is received into a notch in the preorbital. Turbinal bones with sharp spines; edge of preorbital finely serrated; infra-orbital and supraciliary bones roughened. The interorbital ridges arise together in a rosette; their outer

edges diverge and run subparallel to the supraciliary bones, their inner ones at first diverge and then become parallel, as shown in the cut. The postocular and preopercle diverge widely below; both have finely serrated margins, becoming spinous at the angles; border of the opercle also spinous, but without definite strong spines. Lower jaw strongly projecting, its symphysis receivable into a wide edentulous notch in the premaxilla: two strong, blunt, and short spines project horizontally forward from the tip of the mandible. Gills four, a narrow slit behind the fourth; gill-rakers long and slender, 35 on the first arch, of which 26 are on the lower limb.

Teeth.—A band of coarse villiform teeth in each jaw; those bordering the premaxillary notch and those at the mandibular symphysis much enlarged; a triangular patch on the vomer and a band on each palatine; tongue smooth.

Fins.—The dorsal commences well behind the base of the pectoral; the first spine is short, the following regularly increase in size to the sixth or last, which is one-fourth longer than the diameter of the eye; the first ray is longest, a little longer than the last spine. The first spine of the anal lies below the fifth dorsal ray, and the fin extends much further back than does the dorsal. Pectoral almost as long as the head; it is pointed above and extends to above the insertion of the anal. Ventral spine flat and strong, half the length of the head; the first ray is longer, and reaches beyond the vent. Caudal very deeply forked; the middle rays are not half the diameter of the eye, while the longest ray of the upper lobe, which slightly exceeds the lower one, is one-half longer than the head; the length of the peduncle above is nearly twice, and its depth slightly more, than the diameter of the eye.

Scales.—Scales are present on the lower part of the cheek and on the anterior half of the opercle; preopercle naked. All the scales covered with fine striae, which terminate in points averaging 25 in number; a sheath is formed at the bases of the vertical fins, and a triangular scale lies at the axil of the ventral. The lateral line arises with a slight curve at the upper part of the opercle and runs almost straight to the middle caudal rays, each scale with a median notch.

Colour.—Crimson, with the middle of each scale silvery, an alternate longitudinal line of red and silver being thus formed; fins crimson, with the spines and the outer rays of the caudal colourless.

Length.—260 mm.; to end of caudal lobe, 356 mm.

The more elongate form, the smaller and more numerous scales, and the long and more deeply forked caudal are features by which this species may be readily recognized from either *T. affinis* or *T. gerrardi*.

The Swallow-tail, by which very characteristic name the species is known to the South Australian fishermen, was the commonest fish taken on the cruise. The catch at Station 3 weighed 70 lb., while no less than 700 lb. weight was netted at Station 4.

Stations 3, 4, 5, 6, 7, and 8; 72-140 fathoms.

TRACHICHTHODES GERRARDI, Günther.

Beryx gerrardi, Günther: Ann. Mag. Nat. Hist., (5), xx., 1887, p. 238.

Austroberyx gerrardi, McCulloch: "Endeavour" Sci. Res., i., 1911, p. 41, pl. viii.

Red Snapper.

Contrary to local belief, the "Red Snapper" of South Australia is *T. gerrardi*, and not *T. affinis*; not a single specimen of the latter was recognized in the hauls, nor have I so far seen it in the markets, though *T. gerrardi* is to be had daily, often in large quantities. The colouration is similar to that of the Eastern species, and may be thus described:—The ground is iridescent silver suffused with blood-red; this colour occurs where the scales overlap, so that longitudinal lines are produced, separated by the silver tint of the body of the scales. The dorsal spines are colourless, the membrane red, whereas the rays are red and the membrane untinted; the colouration of the anal is similar to the soft dorsal. The pectorals and ventrals are slightly suffused with red; the caudal is red, with the outer and middle rays colourless.

Stations 1, 3, 4, 5, 6, 7, and 8; 45-140 fathoms.

PARATRACHICHTHYS, Waite, 1899.

PARATRACHICHTHYS TRAILLI, Hutton.

Trachichthys trilli, Hutton: Trans. N.Z. Inst., viii., 1876, p. 212.

Trachichthys macleayi, Johnston: Proc. Roy. Soc., Tas., 1880, p. 56.

Paratrachichthys trilli, Waite: Mem. Aust. Mus., iv., 1899, p. 65.

Roughy.

Station 4, 88-94 fathoms, and Station 7, 85 fathoms.

Family SERRANIDAE.

CALLANTHIAS, Lowe, 1839.

CALLANTHIAS ALLPORTI, Günther.

Callanthias allporti, Günther: Ann. Mag. Nat. Hist., (4), xvii., 1876, p. 300.*Callanthias platei*, Boulenger: *id.* (7), iii., 1899, p. 346.*Callanthias platei australis*, Ogilby: Proc. Linn. Soc., N.S.W., xxiv., 1899, p. 173.*Anogramma allporti*, Ogilby: *ib.*, p. 175.

Allport's Perch.

Station 4, 38-94 fathoms, and Station 8, 72 fathoms.

Family ERYTHRICHTHYIDAE.

PLAGIOGENEION, Forbes, 1890.

PLAGIOGENEION MACROLEPIS, McCulloch.

Plagiogeneion macrolepis, McCulloch: "Endeavour" Sci. Res., ii., 1914, p. 104, pl. xx.

Station 4, 88-94 fathoms.

Family CHEILODACTYLIDAE.

DACTYLOSPARUS, Gill, 1862.

DACTYLOSPARUS MACROPTERUS, Forster.

Sciaena macroptera, Forster: in Bloch and Schneider, Syst. Ichth., 1801, p. 342.*Cheilodactylus macropterus*, Richardson: Proc. Zool. Soc., 1850, p. 62.

Jackass Fish.

Stations 3, 4, 6, 7, and 8; 72-140 fathoms.

Family OPLEGNATHIDAE.

OPLEGNATHUS, Richardson, 1840.

OPLEGNATHUS WOODWARDI, Waite.

Hoplegnathus woodwardi, Waite: Rec. Aust. Mus., iii., 1900, p. 212, pl. xxxvii.

Knife Jaw.

Stations 3, 4, 6, and 7; 80-140 fathoms.

Family CARANGIDAE.

CARANX, Lacépède, 1802.

CARANX GEORGIANUS, Cuvier and Valenciennes.

Caranx georgianus, Cuv. and Val.: Hist. Nat. Poiss., ix., 1833, p. 85.

Trevally.

Station 2, 22 fathoms.

Family TRICHIURIDAE.

THYRSITES, Cuvier, 1829.

THYRSITES ATUN, Euphrasen.

Scomber atun, Euphrasen: K. Vetensk. Acad. Nya. Handl., xii., 1791, p. 315.

Thyrsites atun, Cuv. and Val.: Hist. Nat. Poiss., viii., 1831, p. 196, pl. cexix.

Thyrsites altivelis, Richardson: Proc. Zool. Soc., 1839, p. 99.

Thyrsites chilensis, Cuv. and Val.: *ib.*, p. 204.

Barracouta.

Caught on hand-lines near the coasts. All specimens I have seen in South Australia, including those offered in the markets, are very lean and ill-conditioned, quite different from examples with which I was familiar in New Zealand.

Family HISTIOPTERIDAE.

ZANCLISTIUS, Jordan, 1907.

ZANCLISTIUS ELEVATUS, Ramsay and Ogilby.

Histiopterus elevatus, Rams. and Ogil.: Proc. Linn. Soc., N.S.W. (2), iii., 1888, p. 1311.

Zanclistius elevatus, Waite: Proc. N.Z. Inst., i., 1910, p. 25.

Long-finned Boar Fish.

Stations 3, 4, and 6, 80-140 fathoms.

PENTACEROPSIS, Steindachner, 1883.

PENTACEROPSIS RECURVIROSTRIS, Richardson.

Histiopterus recurvirostris, Richardson: Voy. "Ereb. and Terr.," 1845, p. 34, pl. xxii., figs. 5 and 6.

Pentaceropsis recurvirostris, Steindachner: Denk. Akad. Wiss. Wien., xlviii., 1883, p. 13, footnote, pl. vi.

Prosoplismus recurvirostris, Waite: Rec. Aust. Mus., v., 1903, p. 58, pl. vi.

Striped Boar Fish.

Stations 3, 4, and 6, 80-140 fathoms.

Family CYTTIDAE.

CYTTOSOMA, Gilchrist, 1904.

CYTTOSOMA BOOPS, Gilchrist.

Cyttosoma boops, Gilchrist: Marine Invest. S. Africa, iii., 1904, p. 6, pl. xxiii.

Ox-eyed Dory.

Stations 3 and 4, 80-140 fathoms.

Family PSEUDOLABRIDAE.

PSEUDOLABRUS, Bleeker, 1861.

PSEUDOLABRUS TETRICUS, Richardson.

Labrus tetricus, Richardson: Proc. Zool. Soc., 1840, p. 25.*Labrichthys ephippium*, Günther: Ann. Mag. Nat. Hist. (3), xi., 1863, p. 116.*Labrichthys tetrica*, Klunzinger: Arch. für Naturg., xxxviii., 1872, p. 37.*Labrichthys vestita*, Castelnau: Proc. Zool. Soc., Vict., i., 1872, p. 151.*Labrichthys cyanogenys*, Rams. and Ogil.: Proc. Linn. Soc., N.S.W. (2), ii., 1887, p. 242.

Parrot Fish.

Station 2, 22 fathoms.

Family SCORPAENIDAE.

NEOSEBASTES, Guichenot, 1868.

NEOSEBASTES THETIDIS, Waite.

Sebastes thetidis, Waite: Mem. Aust. Mus., iv., 1899, p. 100, pl. xx.*Sebastodes thetidis*, Waite: Mem. N.S.W. Nat. Club, ii., 1904, p. 47.*Neosebastes thetidis*, McCulloch: "Endeavour" Sci. Res., iii., 1915, p. 154.

Thetis Fish.

Stations 3, 4, and 7: 80-140 fathoms.

Family PLATYCEPHALIDAE.

PLATYCEPHALUS, Bloch and Schneider, 1801.

NEOPLATYCEPHALUS, Castelnau, 1872.

The species of this subgenus are distinguished from the typical *Platycephalus* by the great development of their mandibular and palatine teeth, which, together with some near the premaxillary symphysis, form strong canines.

PLATYCEPHALUS (NEOPLATYCEPHALUS) CONATUS, n. sp.

Deep-water Flathead.

Pl. xii.

D. viii.-ix. 14; A. 14; P. 21; V. i. 5; C. 14-15; L. lat. 74-78.

Length of head, from the premaxillary symphysis to the end of the opercular lobe, 2.7-2.8, in that from the premaxillary symphysis to the hypural joint. Snout, including the lower jaw, 3.1-3.2 in the head. Orbit 1.5 in the snout and

4.7-5 in the head. Interorbital space 2.1-2.3 in the length of the orbit and 3.2-3.6 in the snout. Breadth behind the pectorals 1.9-2.09, third dorsal spine 2.3-2.4, and longest dorsal ray 2.6-2.8 in the head.

Head.—Cranial ridges numerous and distinct, but without spines. Anterior orbital spine moderately prominent; inner orbital margins raised, leaving the interorbital space concave. Spines of the preorbital bone small. Cheek with two parallel ridges, with a hollow between them; the upper one bears a microscopic spine just behind the verticle of the postorbital margin, from which a series of ridges radiate over the exposed preopercular bone. Two strong preopercular spines, the lower of which is the larger, and the upper one is directed obliquely upward. Anterior nostril with a short tentacle. The maxilla extends to below the anterior third of the eye. Gill-rakers developed only on the hinder portion of the lower limb of the first arch, where they are short and thick, becoming longer as they approach the angle; anteriorly they are represented by mere groups of spines.

Teeth.—Upper jaw with a band of villiform teeth on each side, which is expanded near the symphysis, where there are also several strong canines. Sides of mandible with a single row of enlarged canine-like teeth, which are largest in the middle of the series and near the symphysis; some minute teeth are present on the outer side of the bases of the larger ones. Vomerine teeth arranged in a single arched series, those in the middle being very small, the outer ones larger. Palatines armed with a row of strong canines, which decrease in size backwards, and have some minute teeth external to their bases.

Scales.—Body covered with ctenoid scales of moderate size, which extend forward to the anterior margin of the eye. Lateral line scales not differentiated from the others; the first two are usually spiniform. There are about 78-88 rows of scales above the lateral line, according to the direction in which they are counted.

Fins.—Origin of the first dorsal fin behind the opercles; the first spine is very small, the third the longest; the second ray is the longest, the others decreasing in length backwards. Anal commencing a trifle behind and terminating well behind the dorsal; its rays are shorter than those of that fin, the fourth the highest, the others decreasing backwards. Ventrals reaching a little beyond the origin of the anal. Caudal subtruncate.

Colour.—Light sandy-yellow after long preservation in formalin, almost without darker marking. There is a dark area in the middle of the opercle, and some bluish blotches

along the side below the lateral line. Pectorals, ventrals, and middle of caudal fin very slightly darker than the rest of the fins.

Described from three specimens, 287-300 mm. long; the specimen figured is 300 mm. in length, and is selected as the type. It is deposited in the South Australian Museum. A series of thirty-six specimens, 227-560 mm. in length, exhibits some variation in the length of the eye and the breadth of the interorbital space; the former is 4.5 in the head in small examples and 5.9 in the largest specimen; the interorbital space is much broader in older specimens than in younger ones, varying from 2.7-1.3 in the orbital length.

This species was discovered by our friend, the late Harald C. Dannevig, who obtained it in considerable quantity in deep water in the Great Australian Bight, and considered it would later become an important addition to the fish supply of the Southern States.

P. conatus is very closely allied to *P. macrodon*, Ogilby, but is readily distinguished by its much shorter and thicker gill-rakers (plate xii., figs. 3 and 4): it usually has a narrower interorbital space and its fins are lighter in colour, while a less striking difference lies in the sculpture of the preopercular bone, portion of which is generally exposed and radially carinate in *P. conatus*, and smooth and covered by skin in *P. macrodon*. *P. conatus* is possibly identical with either *P. grandis*, Castelnau, or *P. speculator*, Klunzinger, but the descriptions of both these species lack all reference to several structures characteristic of our species; further, both were obtained from shallower water in the neighbourhood of Port Phillip, whereas we have no record of *P. conatus* except from deep water in the Great Australian Bight.

Loc.—Great Australian Bight, 80-120 fathoms: Great Australian Bight, south-west of Eucla, 130-320 fathoms; Investigator Strait, South Australia.

“Simplen” Stations 3, 4, and 7, 80-140 fathoms.

Family TRIGLIDAE.

PTERYGOTRIGLA, Waite. 1899.

PTERYGOTRIGLA POLYOMMATA, Richardson.

Trigla polyommata, Richardson: Proc. Zool. Soc., 1839, p. 96.

Hoplonotus polyommatus, Guichenot: Ann. Soc. Linn. Maine et Loire Ichth., ix., 1866.

Pterygotrigla polyommata, Waite: Mem. Aust. Mus., iv., 1899, p. 108.

Flying Gurnard.

Stations 3, 5, 6, and 8, 80-140 fathoms.

CHELIDONICHTHYS, Kaup, 1873.

CHELIDONICHTHYS KUMU, Lesson and Garnot.

Trigla kumu, Less. and Garn.: Voy. "Coquille" Poiss., 1826, p. 214, pl. xix.*Trigla spinosa*, McClell.: Calc. Journ. Nat. Hist., iv., 18—, p. 396, pl. xxii., fig. 2.*Trigla pictipinnis*, Kaup: Arch. für Naturg., 1873, p. 87.*Trigla kumu*, var. *dorsomaculata*, Steindachner: Sitzb. Akad. Wien., lxxiv., 1876, p. 168.*Chelidonichthys kumu*, Jordan and Evermann: Rep. U.S. Fish. Comm., 1896, p. 488, footnote.

Red Gurnard.

Station 4, 88-94 fathoms.

Family URANOSCOPIDAE.

KATHETOSTOMA, Günther, 1860.

KATHETOSTOMA NIGROFASCIATUM, n. sp.

Banded Stonelifter.

Pl. xiii., figs. 1 and 2; and *K. laeve*, fig. 3.

D. 14; A. 14; P. 19; V. i. 5; C. 11.

Length of head from the chin to the opercular margin, 2.5-2.6, depth of body 3.8-3.9 in the length from the chin to the base of the caudal rays. Orbit 1.6-1.7 in the interorbital width. The greatest breadth is just behind the preopercle, where it is almost equal to the length of the head.

Head.—Cranial armature sculptured into rounded tubercles; its hinder margin interrupted by two more or less prominent backward projections, which are extensions of two indefinite ridges extending from behind the orbits. The naked cavity between the orbits is subquadrate, but varies in shape, its width being equal to its length in some specimens, and much narrower in others. Eyes superior, surrounded by raised rugose bones; the postero-exterior angle of the orbit forms an open hiatus, but the hinder internal portion is complete and rounded. Preorbital bone with several raised ridges, which project as obtuse spines on the margin. Lower border of the preopercle with three strong spines, the anterior of which is directed obliquely forward. Opercle unarmed, its surface with radiating, tubercular ridges. Mouth vertical, the lips with rows of short papillae. Maxilla subvertical, broad; its posterior angle below the middle of the eye when the mouth is closed.

A short spine projects forward from the lower portion of each ramus of the lower jaw. The skinny folds crossing the

chin from the branchiostegals are densely fimbriate in older specimens, but less so in young examples.

Teeth.—Upper jaw with a band of villiform teeth on each side, separated by a short interspace at the symphysis. Lower jaw with a row of very large pointed teeth, and a short row of small ones in front of them on each side of the symphysis. A patch of small teeth is present on each side of the very wide vomer. Palatines toothless. Pharyngeal teeth very large. Tongue, and a fold behind the mandibular teeth, densely papillose.

Body depressed anteriorly, compressed posteriorly; it is covered with smooth, naked skin. Lateral line consisting of minute pores arranged on each side of a slightly raised canal: each commences above the base of the humeral spine and converges towards its fellow as it extends backward: the two are very close together on the upper portion of the caudal peduncle, whence they suddenly dip towards the median caudal rays. Humeral spines well developed. Small pelvic spines project forward in front of the ventral fins.

Fins.—The dorsal fin originates about the middle of the length: its rays increase in length to the middle, and then decrease again, leaving the margin rounded. Anal commencing before and terminating behind the dorsal; its rays increase in length to the third last. Pectoral reaching backward to below the anterior fourth of the dorsal; the eighth upper ray is the longest, and the lower ones are somewhat thickened, with their tips free. Ventral inserted below the verticle of the eye: the spine is short and hidden in the skin, but the rays are thick and coarse, and increase in length to the fourth. Caudal slightly rounded.

Colour.—Pale grey above, with four broad blackish cross-bars; the first crosses the hinder portion of the head, and is more or less interrupted; the second is between the pectoral fins; the third is below the dorsal fin: the fourth envelops the greater portion of the caudal. There is a narrow dark bar between the eyes, and three dark lines extend outwards from the orbits; the anterior runs forward on to the maxilla, the median on to the cheek, and the posterior backwards. Pectorals dusky, with broad whitish margins: dorsal and caudal blackish, with broad white borders.

Described from three specimens 157-220 mm. long. The largest is figured, and is selected as the type. It is deposited in the South Australian Museum.

This species is closely allied to *K. laevis*, Bloch and Schneider, but differs in the form and sculpture of the cranial armature, and in the arrangement of the colour-marking on the head.

Loc.—Doubtful Island Bay, South-western Australia; 20-25 fathoms.

“Simplon” Stations 3, 4, 6, and 7, 80-140 fathoms. Great Australian Bight.

Comparing *K. nigrofasciatum* with *K. laeve*,⁽²⁾ the two species are seen to differ in the following characters:—In *K. laeve* the hinder margin of the cranial armature is nearly straight, whereas in our new species it is interrupted by two backward projections. The surface of the exposed bones is sculptured into reticulating ridges in *K. laeve*, and into tubercles in *K. nigrofasciatum*. The postero-internal portion of the orbit of *K. laeve* presents a small hiatus, while it is entire and rounded in the new species. The dark cross-bars are much darker in *K. nigrofasciatum* than in *K. laeve*, and are differently arranged on the head; in the latter the preopercle is largely covered by a dark area, and there are no dark marks radiating from the eye, while the opercle is without marking; in *K. nigrofasciatum* three black lines radiate from the eye, the preopercle is almost without marking, and the upper portion of the opercle is deep black.

K. giganteum, Haast,⁽³⁾ is readily distinguished from both *K. laeve* and *K. nigrofasciatum* by its colour-marking and by the granular sculpture of the cephalic armature. The three may be identified by the following key:—

- a. Head and body with broad dark cross-bars;
no white stripe along the lateral line.
- b. Three dark bars radiating from the eye;
no large dark blotch on the preopercle *nigrofasciatum*
- bb. No bars radiating from the eye; a large
dark blotch on the preopercle ... *laeve*
- aa. Head and body marbled, without cross-bars;
a white stripe along the lateral line ... *giganteum*

K. laeve is recorded from New South Wales, Victoria, and Tasmania. We have a specimen from 37 fathoms off the Investigator Group, South Australia.

(2) *Uranoscopus laevis*, Bloch and Schneider: Syst. Ichth., 1801, p. 47, pl. viii.; Cuvier and Valenciennes: Hist. Nat. Poiss., iii., 1829, p. 319.

Kathetostoma laeve, Günther: Cat. Fish, Brit. Mus., ii., 1860, p. 231; Klunzinger: Arch. Naturg., xxxviii., 1872, p. 28, and Sitzb. Akad. Wiss. Wien., lxxx., 1879, p. 369; Castelnau: Proc. Zool. Soc., Vict., i., 1872, p. 91; Macleay: Proc. Linn. Soc., N.S.W., v., 1881, p. 562; Johnston: Proc. Roy. Soc., Tasm., 1882 (1883), p. 115, and 1890 (1891), p. 33; Waite: Mem. Aust. Mus., iv., 1899, p. 113.

(3) Haast: T.N.Z.I., v., 1873, p. 274, pl. xvi., fig. 2.

Family MONACANTHIDAE.

CANTHERINES, Swainson, 1839.

CANTHERINES AYRAUDI, Quoy and Gaimard.

Balistes ayraudi, Quoy and Gaim.: Voy. "Uranie," Poiss., 1824, p. 216, pl. xlvii., fig. 2.

Aluterus velutinus, Jenyns: Voy. "Beagle," Fish., 1842, p. 157.

Monacanthus vittatus, Richardson: Voy. "Ereb. and Terr.," Fish., 1846, p. 66.

Monacanthus frauenfeldii, Kner: Voy. "Novara," Fische, 1867, p. 397.

Monacanthus ayraudi, Günther: Cat. Fish. Brit. Mus., viii., 1870, p. 244.

Pseudomonacanthus ayraudi, Waite: Mem. N.S.W. Nat. Club, ii., 1904, p. 56.

Chinaman Leather Jacket.

Stations 2, 3, 4, 5, and 6, 22-140 fathoms.

CANTHERINES HIPPOCREPIS, Quoy and Gaimard.

Balistes hippocrepis, Quoy and Gaim.: Voy. "Uranie," Poiss., 1824, p. 212.

Aleuterius variabilis, Richardson: Voy. "Ereb. and Terr.," Fish., 1846, p. 67, pl. lii., figs. 1 to 7.

Monacanthus hippocrepis, Hollard: Ann. Sci. Nat., ii., 1854, p. 338.

Pseudomonacanthus hippocrepis, Waite: Mem. N.S.W. Nat. Club, ii., 1904, p. 56.

Variable Leather Jacket.

Station 5, 85 fathoms.

CANTHERINES MOSAICUS, Ramsay and Ogilby.

Monacanthus mosaicus, Rams. and Ogil.: Proc. Linn. Soc., N.S.W., xi., 1886, p. 5.

Cantherines mosaicus, McCulloch: "Endeavour" Sci. Res., iii., 1915, p. 170, pl. xxxvii., figs. 1 and 2.

Mosaic Leather Jacket.

Station 7, 85 fathoms.

CANTHERINES SETOSUS, Waite.

Monacanthus setosus, Waite: Mem. Aust. Mus., iv., 1899, p. 91, pl. xvi.

Velvet Leather Jacket.

Pl. xiv.

In well-preserved specimens of this species the scales are papilliform and not setiform. Each consists of several curved, upstanding spinules, which are surmounted by rounded fleshy papillae (fig. 3), but these latter are entirely lost by shrinkage in old spirit specimens (fig. 2); the spinules are usually

arranged in short, subvertical rows of two to four on the sides of the head and body, but the rows are oblique and longer on the ventral expansion.

The colour is light-green, with darker cloudy markings disposed over the body and across the throat; these are more distinct in the young than in older specimens, and are usually lost in preservation. The dorsal and anal fins are plain yellow, but the caudal usually bears a blackish curved band on its posterior portion.

C. setosus is very similar to *C. granulatus*, Shaw, but differs in the armature of the dorsal spine, structure of the scales, and number of dorsal and anal rays. The anterior rows of spinules on the dorsal spine are very small in young specimens (fig. 4), and quite obsolete in adults (fig. 5); the scales each consist of several curved spinules instead of a single truncate one, and the dorsal and anal rays number 33-35 and 31-36 respectively.

It is, of course, well known that some fishes when drawn from deep water have their organs more or less displaced owing to diminution of pressure when at the surface; this is especially noticeable in those forms which possess an unyielding body. Nearly all the Ostracions, for example, were affected in this manner, their eyes being forced far out of the sockets, and the intestines, etc., driven through the mouth or vent. Softer-bodied fishes suffer a more general distension, and the eyes appear to be the first organs to be seriously affected. The photograph of *Cantherines setosus* here reproduced (pl. xiv., fig. 6) well exhibits the appearance presented by the bulging eyes, and it may be added that, owing to the tenseness of the membranes, it was impossible to restore them to their sockets by pressure of thumb and fingers.

Loc.—This species occurs in moderately deep water off the southern portion of the coast of New South Wales, Victoria, Tasmania, and South Australia. A number of specimens were taken between Port Hacking and Wollongong, New South Wales, in 50-70 fathoms. Six others are preserved from east of Babel Island, Bass Strait, in 40-100 fathoms, and off the Investigator Group, South Australia, 37 fathoms.

“Simplon” Station 2, 22 fathoms, and Station 8, 72 fathoms.

NOTE ON *CANTHERINES GRANULATUS*, Shaw.

Balistes granulata, Shaw: in White, Voy. N.S. Wales, 1790, p. 295, pl. —.

Monacanthus granulatus, Richardson: Voy. “Ereb. and Terr.,” Fishes, 1846, p. 63, pl. xl., figs. 1 and 2; Steindachner: Sitzb. Akad. Wiss. Wein., liii., 1866, p. 476; Castelnau: Proc. Linn. Soc., N.S.W., iii., 1879, p. 398; Macleay: Proc. Linn. Soc., N.S.W., vi., 1881, p. 324.

Monacanthus granulatus, Günther: Cat. Fish. Brit. Mus., viii., 1870, p. 243; Klunzinger: Arch. Nat., xxxviii., 1872, p. 43, and Sitzb. Akad. Wiss. Wien., liii., 1879, p. 421.

Monacanthus perulifer, Castelnau: Proc. Zool. Soc., Vict., i., 1872, p. 245.

Monacanthus margaritifer, Castelnau: Proc. Zool. Soc., Vict., ii., 1873, p. 80, substitute for *perulifer*; *id.*: Proc. Linn. Soc., N.S.W., ii., 1878, p. 247; Macleay: Proc. Linn. Soc., N.S.W., vi., 1881, p. 320.

Monacanthus brunneus, Castelnau: Proc. Zool. Soc., Vict., ii., 1873, p. 145 (preoccupied).

Monacanthus obscurus, Castelnau: Res. Fish. Aust. (Vict. Offic. Rec. Philad. Exhib.), 1875, p. 51, substitute for *brunneus*; *id.*: Proc. Linn. Soc., N.S.W., iii., 1879, p. 357.

Monacanthus damelii, Günther: Ann. Mag. Nat. Hist. (4), xvii., 1876, p. 402, substitute for *brunneus*.

Monacanthus santi-joanni, Castelnau: Proc. Linn. Soc., N.S.W., ii., 1878, p. 246; Macleay: Proc. Linn. Soc., N.S.W., vi., 1881, p. 321.

Pseudomonacanthus granulatus, Waite: Rec. Aust. Mus., vi., 1905, p. 80, and *loc. cit.*, vi., 1906, p. 210.

According to Günther's description of *C. granulatus*, the dorsal spine has no barbs in front, though they are clearly shown in Richardson's figure, and are present in all the specimens examined. Günther's error has led to considerable confusion, and the species has received several names in consequence. The accompanying synonymy, which appears to be correct, has already been suggested by Castelnau and Klunzinger in their various papers quoted.

Günther has very doubtfully included *Balistes papillosus*, Linnaeus,⁽⁴⁾ in the synonymy of *C. granulatus*. That species is described as having 29 dorsal and 21 anal rays, whereas we find 28-30 dorsal and 26-29 anal rays in 10 specimens; this, together with the fact that the locality of *B. papillosus* was unknown, leaves nothing to justify its association with *C. granulatus*.

Loc.—Twenty specimens, 66-207 mm. long, are in the Australian Museum collection from Port Jackson, New South Wales, and Fremantle, Western Australia.

Family OSTRACIIDAE.

For particulars of the species of this family see the following paper, page 477 *et. seq.*

CAPROPYGIA UNISTRIATA, Kaup.

Station 2, 22 fathoms; Station 3, 80-140 fathoms; Station 5, 85 fathoms; Station 6, 85 fathoms; and Station 8, 72 fathoms.

ANOPILOCAPROS GIBBOSUS, n. sp.

Station 4, 88-94 fathoms.

(4) Linnaeus, Syst. Nat., ed. 10, 1758, p. 328.

ARACANA AURITA, Shaw.

Station 2, 22 fathoms, and Station 5, 85 fathoms.

ARACANA SPILOGASTER, Richardson, var. ANGUSTA, n. var.

Station 3, 80-140 fathoms.

Family TETRAODONTIDAE.

TETRAODON, Linnaeus, 1758.

TETRAODON ARMILLA, n. sp.

Pl. xv.

D. 11-12; A. 9-11; P. 21; C. 9+2.

Head, measured from the upper lip to the gill-opening, 2.6-2.9 in the length without the caudal fin. Snout, from the upper lip to the eye, 1.6-1.7 in the head. Eye 2.4-3.5 in the snout and 4.2-5.6 in the head. Longest dorsal rays, 2.7-2.9, anal 3-3.2, and caudal fin 1.2-1.4 in the head.

Head.—Snout subconical, without any chin. Nostrils absent, represented by a small simple tentacle on each side. Eye much nearer the gill-opening than the mouth and close to the upper profile of the head. The anterior angle of the orbit projecting slightly above the general contour; upper and lower eyelids adnate to the ocular membrane. Margin of the gill-opening without lobules. The inner flap usually concealed.

Body.—The skin of the back is usually smooth, sometimes slightly plicate like that of the abdomen. It is closely beset with minute spinules, which extend from the middle of the snout backward to the caudal peduncle on the upper-surface and sides, and cover the whole abdominal surface below; these spinules cannot always be traced in formalin specimens, being hidden in the skin, but they are quite distinct in examples preserved in alcohol. No fold along the lower portion of the sides.

Fins.—Dorsal and anal fins rounded, and variable in size; they are generally short and narrow as figured, but may be longer and broader. Pectorals more or less bilobed, the median rays being shorter than those above or below them. Caudal fin much larger in the young than in adults, its margin more or less rounded.

Colour.—Upper-surface of snout, back, and tail grey or brown, this colour descending on to the lighter sides behind the pectoral fins. A broad, oblique, dark band from the eye to the lower-surface of the snout, leaving the lips white. A large black curved band encircles the gill-opening and pectoral fin, the enclosed area being darker than the surrounding parts. Lower portion of the caudal fin blackish, the remaining fins without markings. These markings vary in their intensity, and are much more distinct in small examples than in larger ones.

Described from 12 specimens, 103-211 mm. long. The specimen figured is 200 mm. long, and is selected as the type; it is deposited in the South Australian Museum.

Loc.—Off Flinders Island, Bass Strait, 40 fathoms; Marsden Point, Kangaroo Island; nine to ten miles west of Glenelg jetty, Gulf St. Vincent, 10-12 fathoms; off St. Francis Island, Investigator Group, South Australia, 30 fathoms; off Flinders Island, Investigator Group, South Australia, 37 fathoms; Doubtful Island Bay, South-western Australia, 20-25 fathoms.

"Simplon" Stations 2, 3, 4, 6; and 7, 22-140 fathoms, Great Australian Bight.

Family DIODONTIDAE.

ATOPOMYCTERUS, Bleeker.

ATOPOMYCTERUS NICTHEMERUS, Cuvier.

Diodon nictemerus, Cuvier: Mem. Mus., 1818, p. 135, pl. iv.

Atopomycterus nychthemerus, Günther: Cat. Fish. Brit. Mus., viii., 1870, p. 315.

Station 3, 80-140 fathoms.

EXPLANATION OF PLATES.

PLATE XII.

- Fig. 1. *Platycephalus (Neoplatycephalus) conatus*, n. sp. Type, 300 mm. long, Great Australian Bight, 80-120 fathoms.
 „ 2. Head of type.
 „ 3. Gill-rakers of first gill-arch of type.
 „ 4. Gill-rakers of first gill-arch of *N. macrodon*, Ogil.
 „ 5. Teeth of *N. conatus*. Type.

PLATE XIII.

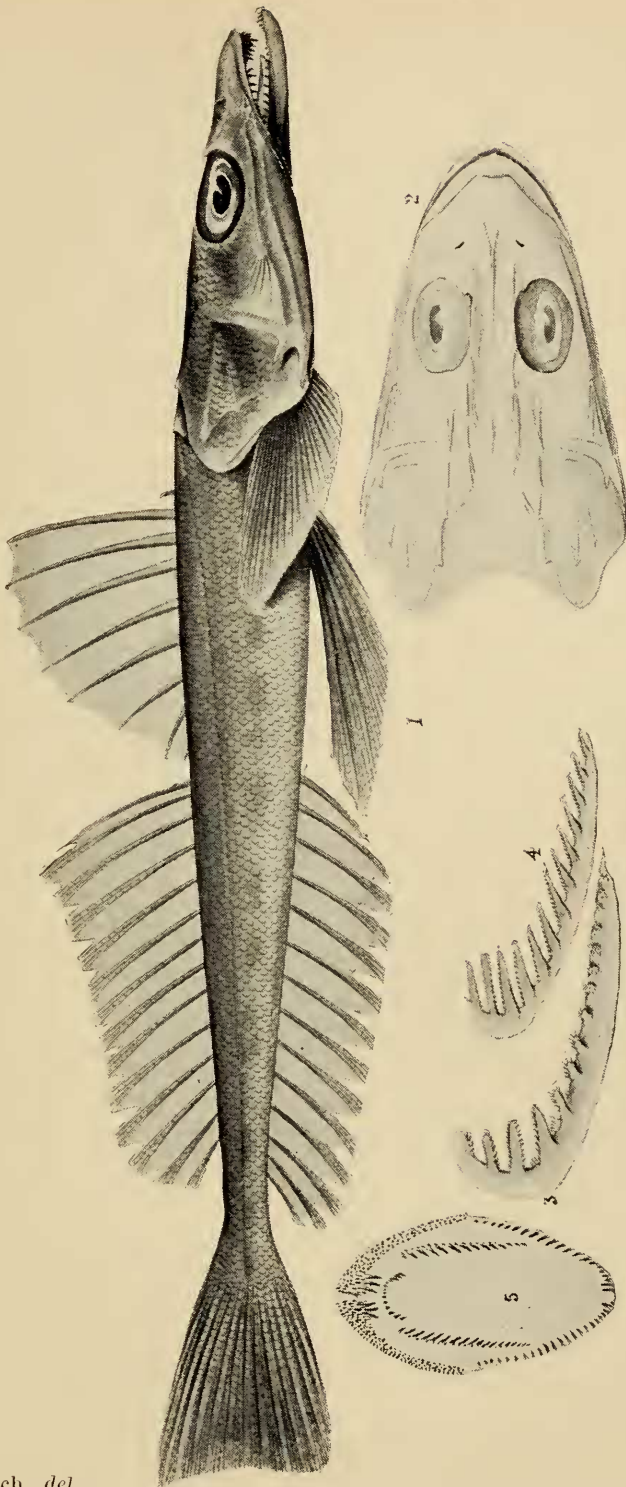
- Fig. 1. *Kathetostoma nigrofasciatum*, n. sp. Type, 220 mm. long, Great Australian Bight, South Australia.
 „ 2. Side view of same specimen as fig. 1.
 „ 3. *Kathetostoma laeve*, Bl. Schn. Head of a specimen, 226 mm. long, New South Wales.

PLATE XIV.

- Fig. 1. *Cantherines setosus*, Waite. A specimen 196 mm. long, between Port Hacking and Wollongong, 50-70 fathoms.
 „ 2. Scales of type.
 „ 3. Scales of a well-preserved formalin specimen.
 „ 4. Dorsal spine of a young specimen.
 „ 5. Dorsal spine of an older specimen.
 „ 6. Portion of specimen from 72 fathoms, Great Australian Bight, illustrating the effect of reduction of pressure on the eyes.

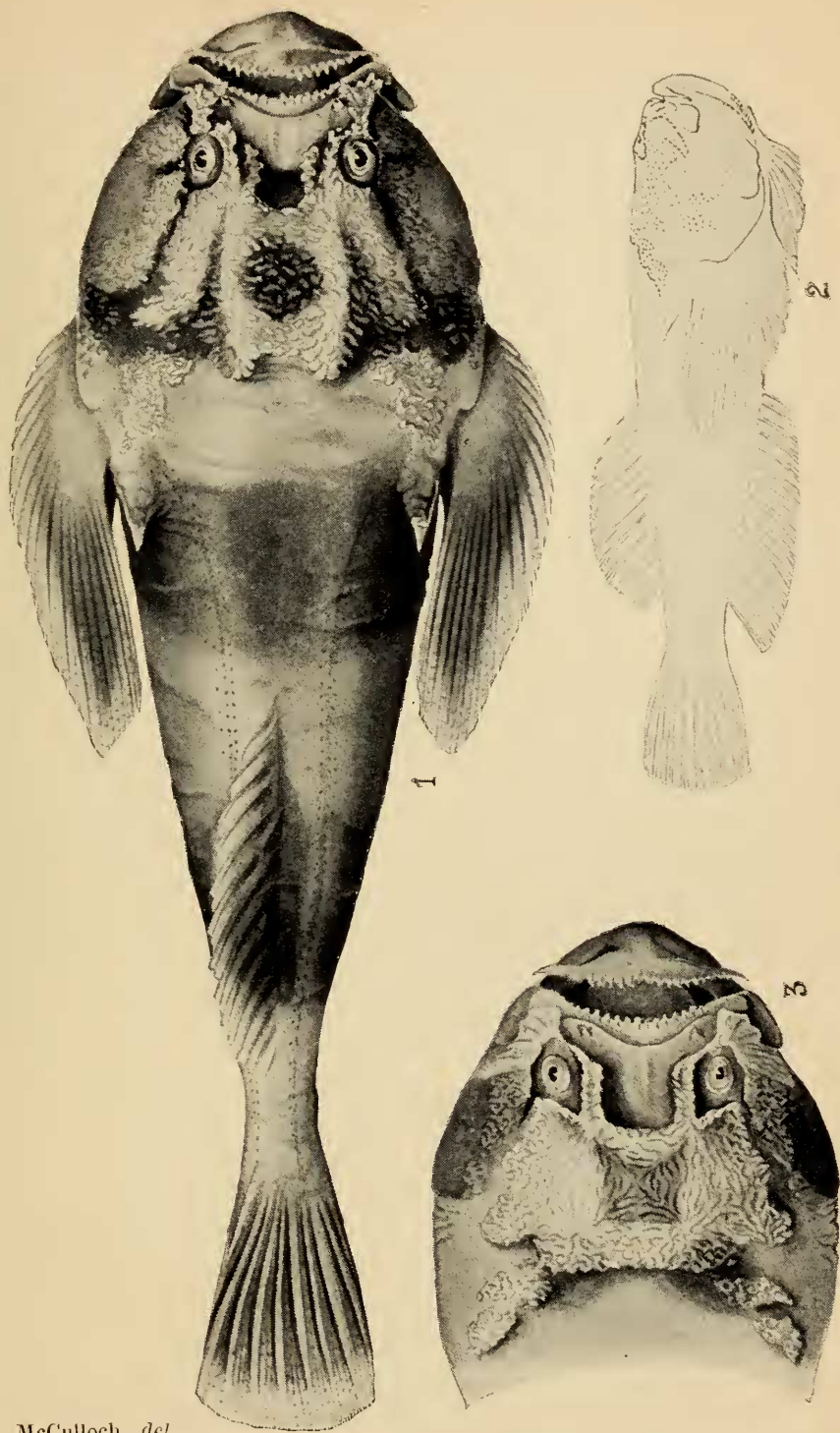
PLATE XV.

Tetraodon armilla, n. sp. Type, 200 mm. long, Great Australian Bight.



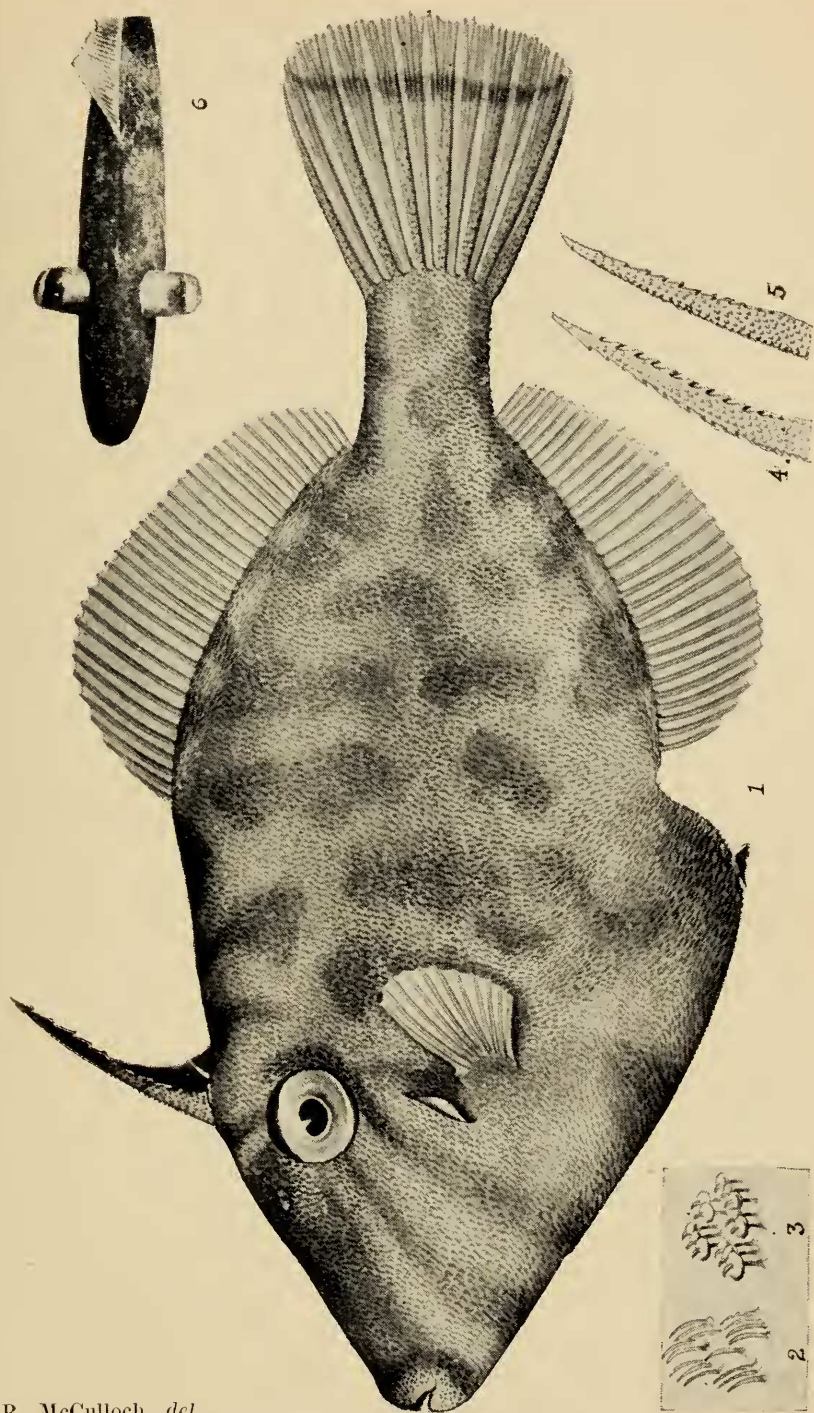
A. R. McCulloch, *del.*

Neoplatycephalus conatus, n. sp.



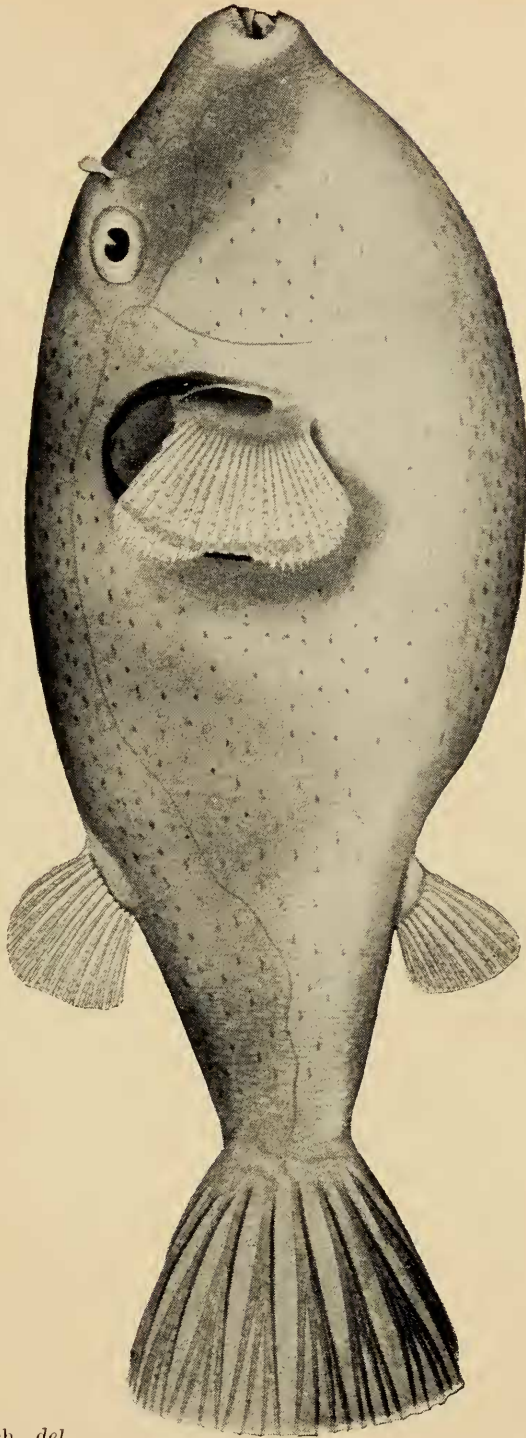
A. R. McCulloch, *del.*

1, 2. *Kathetostoma nigrofasciatum*, n. sp. 3. *K. laeve*, Bl. Schn.



A. R. McCulloch, *del.*

Cantherines setosus, Waite.



A. R. McCulloch, *del.*

Tetraodon armilla, n. sp.